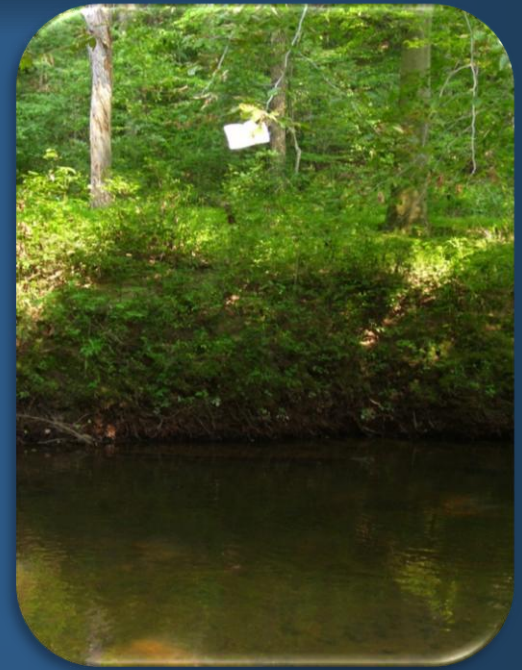


# Water Quality Studies for Accotink Creek and Long Branch

1<sup>st</sup> Public Meeting  
Burke, VA  
September 10, 2014





# Why are we here?

- To learn about water quality in portions of Accotink Creek and Long Branch
- To explain efforts that Virginia is undertaking to improve and protect water quality



# Accotink Creek and Long Branch Water Quality Studies

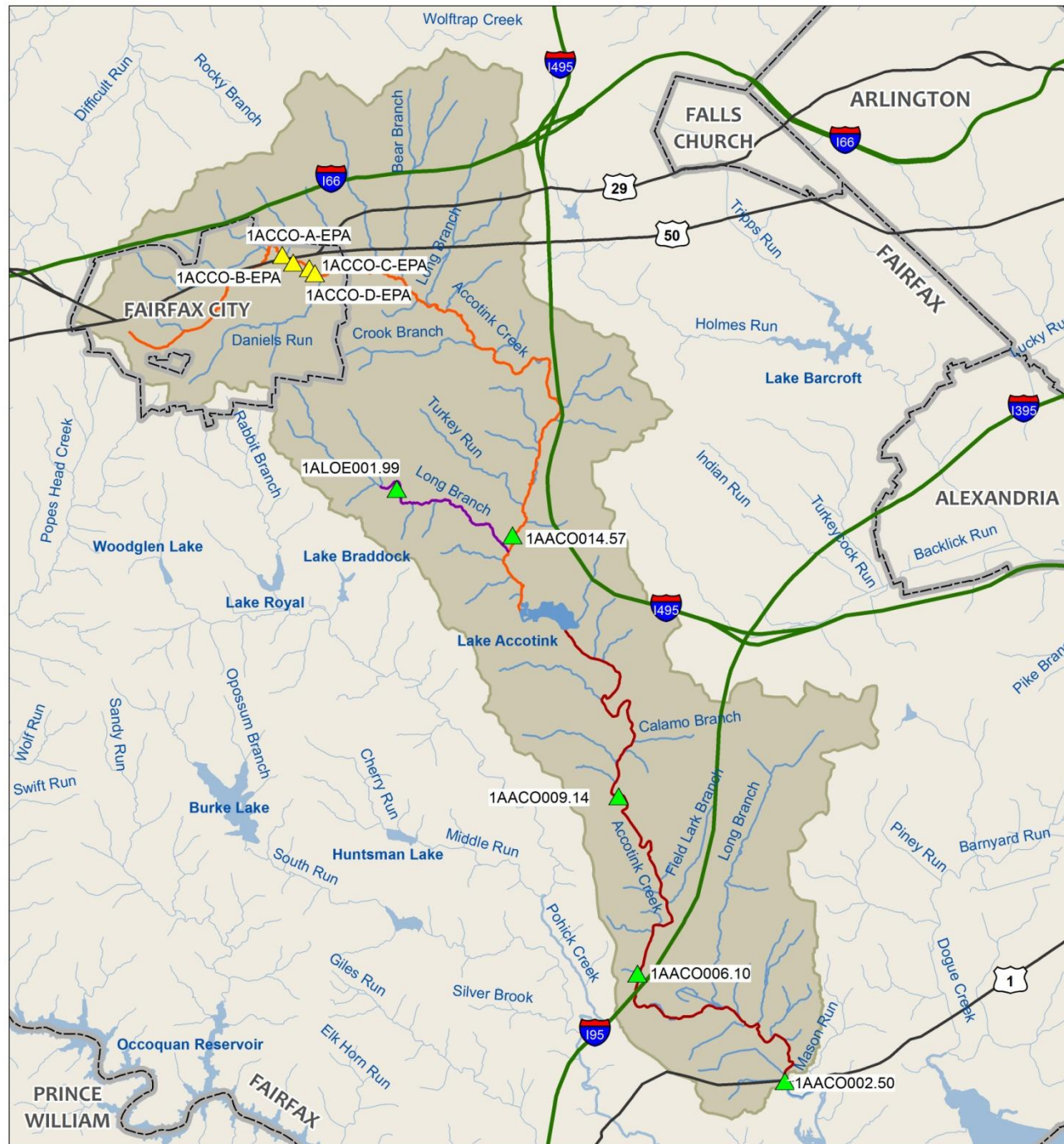
- Who is involved in this process?
- Where are Accotink Creek and Long Branch located?
- Why are we studying Accotink Creek and Long Branch?
- How do we know the standards aren't being met?
- What is a TMDL?
- What is being done to correct the problem?



# Who is involved?

- DEQ :** Virginia Department of Environmental Quality – Lead Agency for TMDL Development
- Contractor:** Performs modeling for TMDL Development, for this project, contractor is the Interstate Commission on the Potomac River Basin
- TAC:** Representatives from state and local governments, watershed groups, planning district commission, soil and water conservation districts, etc. Provides technical input and information for TMDL development
- Citizens:** Any citizen who wishes to participate in the project; provide local knowledge and information





# Aquatic Life Use Impairments in Accotink Creek Watershed

Stream Name	Impairment Cause	Impairment Length (miles)	Year Impairment First Listed	Upstream Limit	Downstream Limit
Accotink Creek	Benthic Macroinvertebrates	9.92	1996	Outlet of Lake Accotink	Start of the tidal waters of Accotink Bay
Accotink Creek	Benthic Macroinvertebrates	11.17	2008	Headwaters of Accotink Creek	Start of Lake Accotink
Long Branch	Benthic Macroinvertebrates	2.24	2008	Confluence with an unnamed tributary to Long Branch, at the Route 651 (Guinea Road) bridge	Confluence with Accotink Creek

\* Impairment information from the 2012 Integrated Report

# How do we know if water bodies in Virginia are healthy?

- Perform physical and chemical monitoring on water bodies throughout the state
- Monitor parameters such as:
  - pH
  - Temperature
  - Dissolved Oxygen
  - Biological Community
  - Bacteria
  - Nutrients
  - Fish Tissues
  - Metals/Toxic Pollutants





# What do we do with the monitoring data that is collected?

Compare the data collected to the water quality standards

Water Quality Standards:

- Regulations based on federal and state law
- Set numeric and narrative limits on pollutants
- Consist of designated use(s) and water quality criteria to protect the designated uses





# Designated Uses

- Recreation
- Public Water Supply
- Wildlife
- Fish Consumption
- Shellfish
- Aquatic Life



*Accotink Creek and Long Branch do not meet the state's water quality standards for the aquatic life use because of poor health in the benthic macroinvertebrate community.*

# Aquatic Life Use: What are benthic macroinvertebrates?

Aquatic invertebrates  
(bugs) that live on the  
bottom of streams, rivers,  
and other bodies of water



## Why do we care about these bugs?

- Important food source for fish (important link in the food chain)
- Important cycling of nutrients
- Good indicators of overall stream health





# Aquatic Life Use Impairment: Benthic Macroinvertebrates

## Pollution Intolerant Invertebrates



Mayfly



Stonefly



Caddisfly

## Moderately Pollution Tolerant Invertebrates



Crayfish



Water Penny



Net spinning  
Caddisfly

## Highly Pollution Tolerant Invertebrates



Midge Larvae



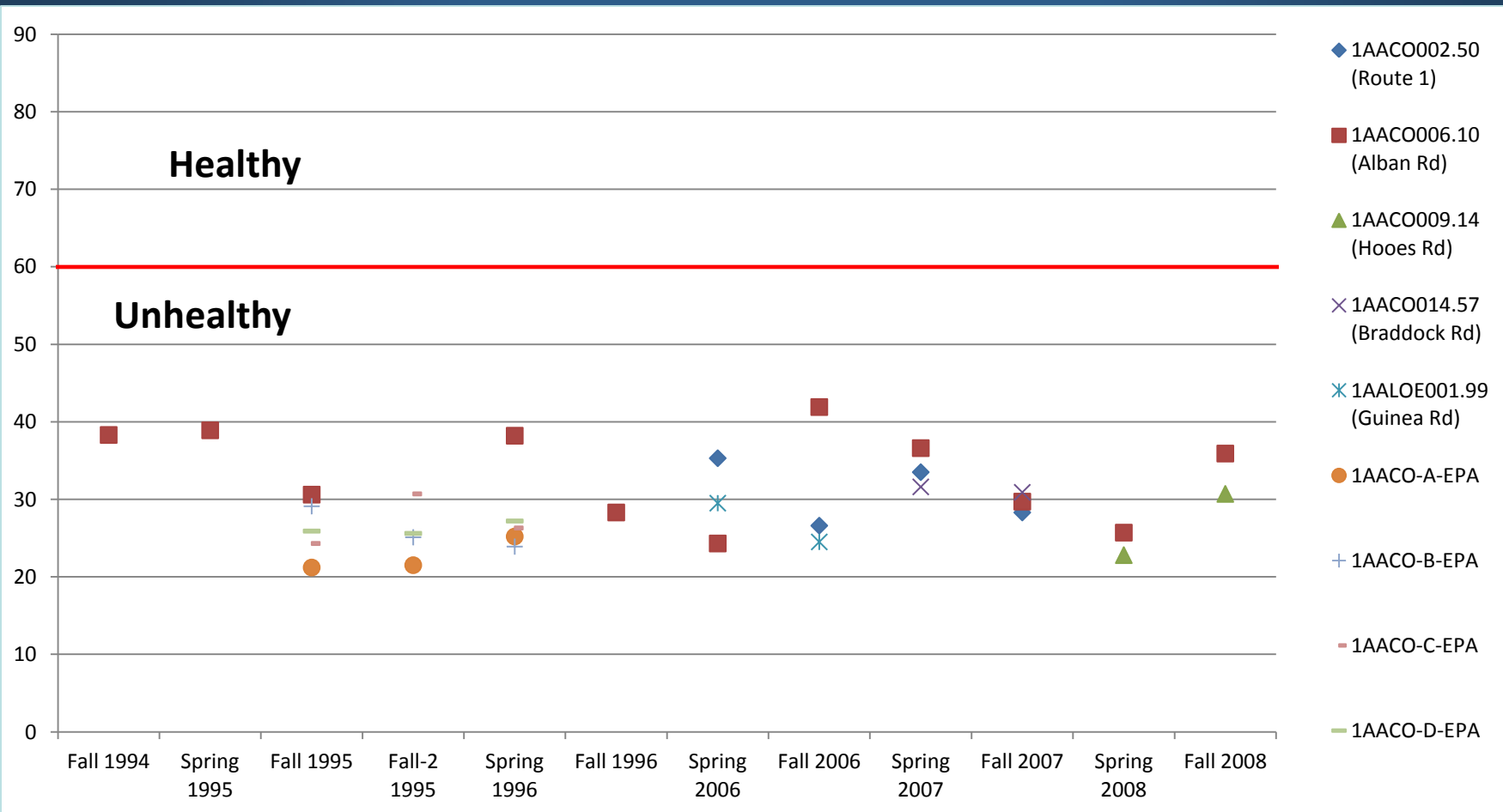
Segmented Worm



Leech

# What are the bugs like in Accotink Creek and Long Branch?

*Bugs are collected and identified, and the stream is given a score based off the number and type of bugs present in the stream. If the stream gets a score of 60 or above, it is considered healthy. All the scores for Accotink Creek and Long Branch were below 60.*





# What happens when a water body doesn't meet water quality standards?

- Waterbody is listed as “impaired” and placed on the 303(d) list
- Once a water body is listed as impaired, a Total Maximum Daily Load value must be developed for that impaired stream segment to address the designated use impairment.
- TMDL Studies are required by law:
  - 1972 Clean Water Act (CWA)
  - 1997 Water Quality Monitoring Information and Restoration Act (WQMIRA)

# What is a TMDL ?

## *Total Maximum Daily Load*

$$\text{TMDL} = \text{Sum of WLA} + \text{Sum of LA} + \text{MOS}$$

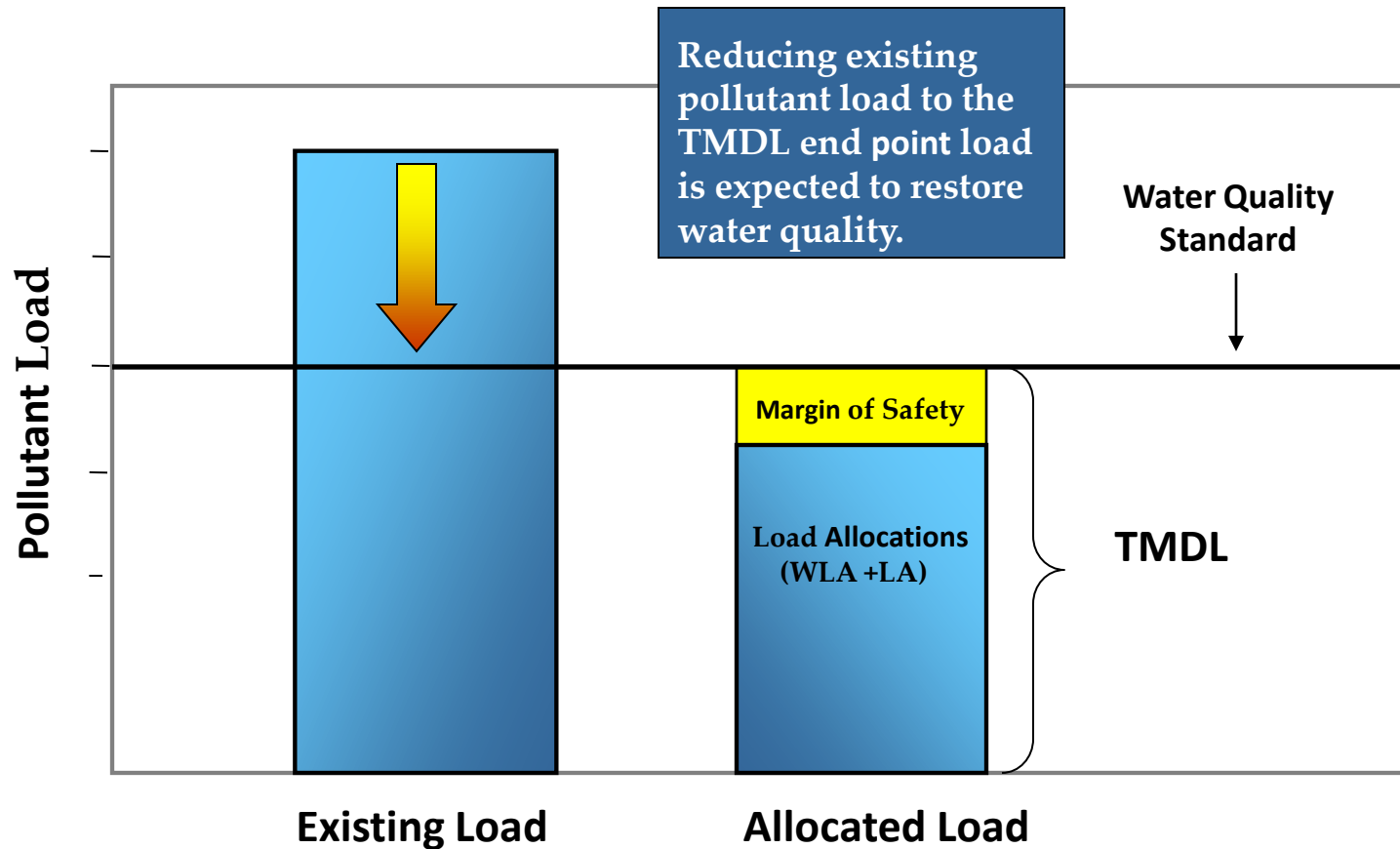
Where:

TMDL	=	Total Maximum Daily Load
WLA	=	Waste Load Allocation (Point Sources)
LA	=	Load Allocation (Non-point Sources)
MOS	=	Margin of Safety (Implicit or Explicit)

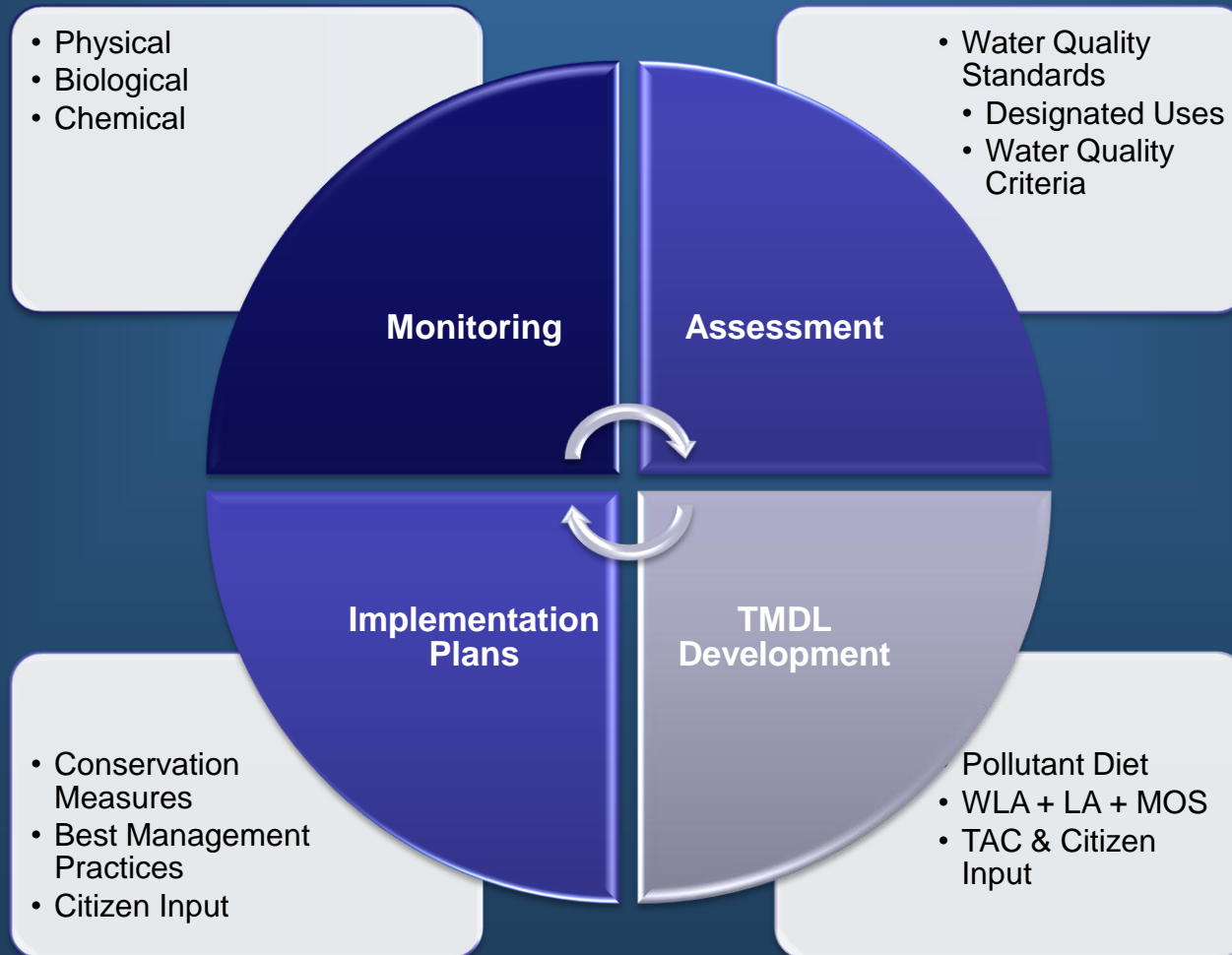
*A TMDL is the total amount of a certain pollutant that a water body can receive and still not exceed water quality standards.*



# An Example TMDL



# TMDL Development Process



# Project History

Accotink Creek Benthic Impairment

2007 → 2011

Resulted in a Flow TMDL



2012

Lawsuit filed challenging the Flow TMDL

2013

U.S. District Court ruled in favor of the Plaintiffs & remanded the TMDL to EPA for reconsideration

Virginia commits to establishing a TMDL replacement for Accotink Creek by 2016



# Accotink Project Plan

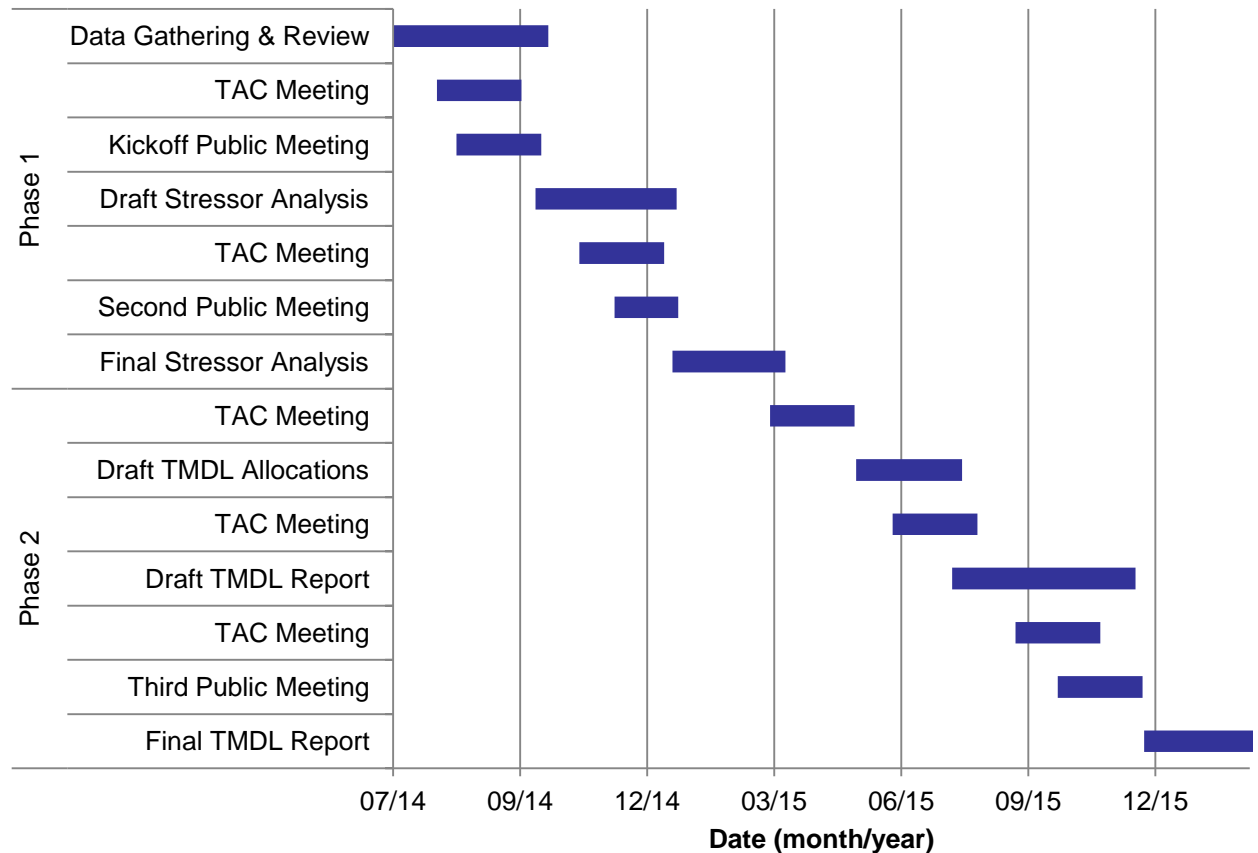
## Phase 1: Stressor Analysis & Watershed Characterization

Target completion date February 2015

## Phase 2: TMDL development

Target completion date February 2016

### Accotink Creek TMDL Project Projected Timeline

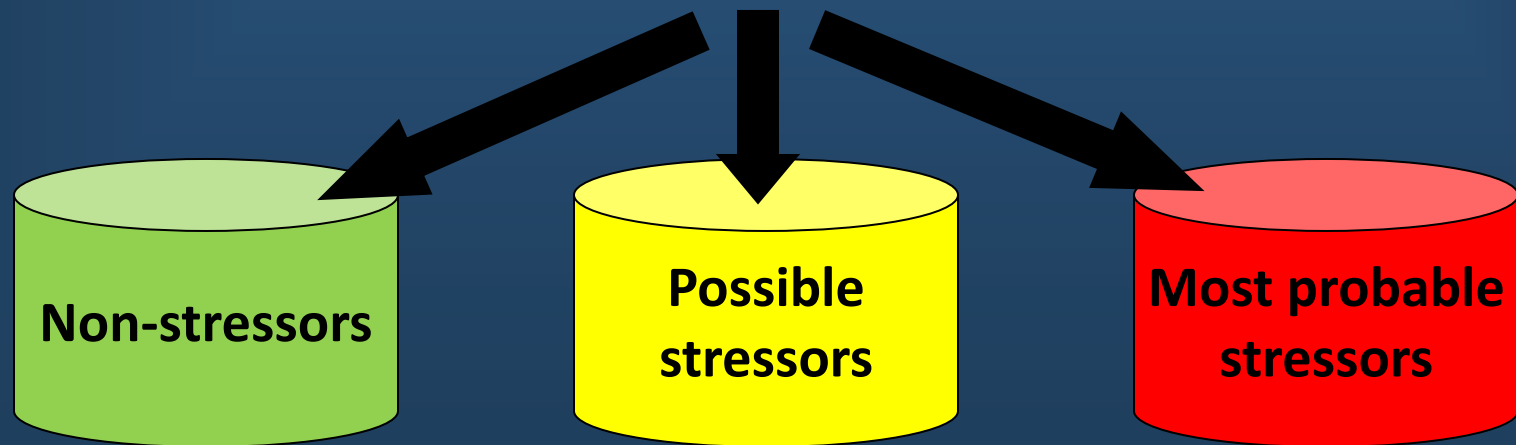


First Technical Advisory Group Meeting was held August 26, 2014

# What is a Stressor Analysis?

Answers the question: *What pollutant is causing the aquatic life impairment?*

1. List all potential causes, for example:  
DO, nutrients, pH, sediment, temperature, toxics, etc.
2. Analyze the evidence for and against each pollutant:  
Biological, habitat, water quality, historic data, etc.
3. Categorize each of the causes as being one of the following:



# Potential Stressors

- Temperature
- pH
- DO
- Total Dissolved Solids
- Chlorides
- Conductivity
- Nutrients
- Metals
- Toxics
- Sediment
- Hydro-modification



# Data Gathering



# Data Gathering

## Additional Data Sources

### Fairfax County

Water Chemistry

Benthic Data

Fish Data

GIS Data

### USGS

3 Active Gage Stations

Storm Event Samples

National Water Quality Assessment Program

### EPA

4 Monitoring Sites

Restoration Study

# What happens next?

- Comment Period for Materials presented at the Public Meeting:

September 10, 2014 to October 10, 2014

Comments should be submitted in writing to:

Jennifer Carlson

*[jennifer.carlson@deq.virginia.gov](mailto:jennifer.carlson@deq.virginia.gov)*

13901 Crown Court, Woodbridge, VA 22193

- Wrap up the data gathering process
- Begin work on the draft stressor analysis and watershed characterization
- Another public meeting will be held to review the results of the draft stressor analysis



# *Questions? Comments?*



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**Virginia DEQ - NRO**

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